

**REMARKS**

Claims 1-18 are pending in the application; the status of the claims is as follows:

Claims 1-3 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,081,321 to Miyagawa (hereinafter "Miyagawa").

Claims 4-8, 11, 13-16, and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Miyagawa in view of U.S. Patent No. 4,932,761 to Shingaki et al. (hereinafter "Shingaki").

Claims 9, 10, 12, and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Miyagawa in view of U.S. Patent No. 5,155,618 to Matsubara et al. (hereinafter "Matsubara").

Claim 1 has been amended to more particularly point out the subject matter of the invention, claim 4 has been amended to place in independent form, and claims 10 and 13 have been amended to correct grammatical errors. These changes do not introduce any new matter.

**35 U.S.C. § 102(b) Rejection**

The rejection of claims 1-3 under 35 U.S.C. § 102(b) as being anticipated by the Miyagawa patent, is respectfully traversed based on the following.

Amended claim 1 recites, *inter alia*, "... a first driver for driving a first electrode of selected ones of said plurality of light shutter elements ...; and a second driver for driving a second electrode common to said plurality of light shutter elements." As admitted in section 5, page 4, of the Office Action, Miyagawa does not teach a "... common electrode and the individual electrodes of the optical shutter elements ...." Because, Miyagawa fails to disclose each element of amended claim 1, claim 1 distinguishes over Miyagawa.

Claims 2 and 3 depend from claim 1. It is respectfully, submitted therefore, that claims 2 and 3 distinguish over Miyagawa for at least the same reasons as provided above in regards to claim 1.

Accordingly, it is respectfully requested that the rejection of claims 1-3 under 35 U.S.C. § 102(b) as being anticipated by the Miyagawa patent, be reconsidered and withdrawn.

### **35 U.S.C. § 103(a) Rejections**

The rejection of claims 4-8, 11, 13-16, and 18 under 35 U.S.C. § 103(a), as being unpatentable over the Miyagawa patent in view of the Shingaki patent, is respectfully traversed because there can be no motivation to make the suggested combination, and because the combination fails to teach all elements of the rejected claims.

Miyagawa teaches a full color printer having an array of optical shutter elements. Red, green and blue lights are sequentially projected onto the optical shutter elements, and a drive voltage is applied to selected light shutter elements in synchronism with the color change. *See* Abstract. The voltage applied to the selected light shutter elements depends on the color of the light. However, high-speed, pulse-like switching of the driving voltage may cause high-voltage spike noise which can damage the driving electronics. *See* column 1, lines 31-56. To prevent the generation of spike noise, Miyagawa teaches that the drive voltage is to be changed smoothly. Column 2, lines 1-25.

Shingaki teaches methods and circuitry for driving a light shutter “to improve the speed of response so as to give a desired quantity of light within a shortened period of time.” The speed of response is improved by applying an excessive voltage to a light shutter for a short time when the light shutter is being turned on. *See* Fig. 11. The excessive voltage can be obtained by applying the driving voltage plus the excess voltage to one electrode of a light shutter, while the other electrode of the light shutter is grounded. *See* Figs. 13a and 13b. Alternatively, the driving voltage may be applied to one

electrode of the light shutter while a negative voltage pulse is applied to the other electrode. *See* Figs. 14a and 14b.

Miyagawa explicitly teaches away from applying pulse-like voltage-spikes because the rapid voltage change creates potentially damaging spike noise. Shingaki teaches using an initial voltage pulse to improve the light shutter response time. Modifying Miyagawa to incorporate the initial voltage pulse taught by Shingaki would, therefore, would render it unsuitable for its intended purpose (providing a smooth drive voltage waveform.) However, “if proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.” MPEP 2143.01 citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Accordingly, there can be no motivation to combine Miyagawa and Shingaki as suggested in the Office Action.

Moreover, Miyagawa teaches that spike noise is potentially damaging to the driver circuitry. To eliminate the spike noise, the driving voltage is varied smoothly “approaching a sine wave,” or alternatively, that step changes in voltage should be “less than about several millivolts.” Column 4, line 65 to column 5, line 2 and lines 26-31. Whereas, Shingaki suggests using a driving voltage having an initial pulse of 10 to 30 volts, or higher. Column 4, lines 17-46. “If proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.” MPEP 2143.01 citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). Thus, there is no motivation to make the proposed combination of Miyagawa and Shingaki.

The bias voltage is selected so that no light leaks through the undriven light shutters when the bias voltage alone is applied to a light shutter. The driving voltage is selected so that the sum of the bias voltage and the drive voltage is equal to the half-wave

voltage at which transmitted light of maximum intensity is available. *See* Figs. 19 and 20, and column 6, lines 53-63.

Even assuming *arguendo*, that the combination were proper, it is respectfully submitted that the combination of Miyagawa and Shingaki still fails to teach all elements of the rejected claims. Both references teach turning a driving voltage on and off for selected light shutters responsive to image data. Shingaki also teaches applying a constant negative bias voltage to a common electrode for a block of light shutters and a positive driving voltage to the other electrode of selected light shutters in the block. However, Shingaki is utterly silent as to changing the applied voltages for different colored light. Miyagawa teaches changing the driving voltage according to the color of light. At best, the combination suggests applying a bias voltage to a common electrode, while driving the other electrodes with a driving voltage depending on the color of light and the image data.

In contrast, claim 4 recites "... altering a potential of the common electrode to alter an electric field acting on the light shutter elements depending on the color of the light emitted from the light source." As discussed above, neither Miyagawa nor Shingaki disclose, teach, or otherwise suggest changing a bias voltage responsive to a change in the color of light being controlled by the light shutter. Accordingly, claim 4 distinguishes over the cited references.

Claims 5-8 depend from claim 4 and, therefore, distinguish over the combination of Miyagawa and Shingaki for at least the same reasons as provided above in respect of claim 4.

Claim 11 depends from claim 1, which recites *inter alia* "a second driver for driving a second electrode common to said plurality of light shutter elements, said second driver altering a voltage on the second electrode in synchronization with switching of the colors of the light source." As discussed above regarding claim 4, the combination of Miyagawa and Shingaki fails to disclose, teach, or suggest changing a voltage on common electrode of a group of light shutters based on the color of the source light. Therefore,

claim 1, as well as claim 11 which depends therefrom, also distinguish over the proposed combination.

With respect to claim 13, it is respectfully submitted that as applied above in regards to claims 1 and 4, the combination of Miyagawa and Shingaki fails to disclose, teach, or suggest a driver that “[sets] the individual electrodes to have potentials in accordance with image data and [alters] a driving condition of the common electrode in synchronization with switching the colors of the light source.” Accordingly, claim 13 distinguishes over the combination of Miyagawa and Shingaki.

Claims 14 depend from claim 13 and, therefore, distinguish over the combination of Miyagawa and Shingaki for at least the same reasons as provided above in respect of claim 13.

With regards to claim 15, for at least the same reasons as applied above in regards to claims 1, 4, and 13, it is respectfully submitted that the combination of Miyagawa and Shingaki fails to disclose, teach, or suggest a method for driving a light shutter device including:

“... in synchronization with the incidence of the light of the first color to the light shutter elements, setting a common electrode for all the light shutter elements to have a first potential by controlling the driver;  
... in synchronization with the incidence of the light of the second color to the light shutter elements, setting the common electrode to have a second potential which is different from the first potential by controlling the driver; ... and  
in synchronization with the incidence of the light of the third color to the light shutter elements, setting the common electrode to have a third potential which is different from the first potential and from the second potential by controlling the driver,”

as required by claim 15. Therefore, claim 15 distinguishes over the combination of Miyagawa and Shingaki.

Claims 16 and 18 depend from claim 15 and, therefore, distinguish over the combination of Miyagawa and Shingaki for at least the same reasons as provided above in respect of claim 15.

Accordingly, it is respectfully requested that the rejection of claims 4-8, 11, 13-16, and 18 under 35 U.S.C. § 103(a) as being unpatentable over Miyagawa in view of Shingaki, be reconsidered and withdrawn.

The rejection of claims 9, 10, 12, and 17 under 35 U.S.C. § 103(a) as being unpatentable over the Miyagawa patent in view of the Matsubara patent, is respectfully traversed based on the following.

As provided above in respect of claims 4, Miyagawa teaches changing a driving voltage responsive to a changing color of the light being controlled by a light shutter, but fails teach using a bias voltage on a common electrode; and, indeed, fails to provide any teaching with respect to electrode configurations. Matsubara teaches that polarization of the lights shutters may be prevented by applying a bias voltage  $V_r$  to the common electrode during a non-recording interval (an interval between pages). *See* column 3, lines 46-59. Matsubara appears to teach biasing the common line at zero volts while writing a page, and fails to teach anything with respect to changing the bias based on the color of the light.

Therefore, the combination of Miyagawa and Matsubara fail to disclose, teach, or suggest a “driver for driving a common electrode of said plurality of light shutter elements, said second driver altering said second voltage in synchronization with switching of the colors of the light source” as required by claim 1. Because the combination fails to teach all elements of claim 1, claim 1 distinguishes the combination of Miyagawa and Matsubara. Claim 9, 10, and 12 depend from claim 1 and, therefore, distinguish over the combination of Miyagawa and Matsubara for at least the same reasons.

With respect to claim 17, it is respectfully submitted that as applied above in respect of claim 1, the combination of Miyagawa and Matsubara fails to disclose, teach or suggest a method for driving a light shutter device including:

“... in synchronization with the incidence of the light of the first color to the light shutter elements, setting a common electrode for all the light shutter elements to have a first potential by controlling the driver;  
... in synchronization with the incidence of the light of the second color to the light shutter elements, setting the common electrode to have a second potential which is different from the first potential by controlling the driver; ... and  
in synchronization with the incidence of the light of the third color to the light shutter elements, setting the common electrode to have a third potential which is different from the first potential and from the second potential by controlling the driver,”

as required by claim 15. Therefore, claim distinguishes over the proposed combination of references. Claim 17 depends from claim 15 and, therefore, distinguishes over the combination of Miyagawa and Matsubara for at least the same reason.

Accordingly, it is respectfully requested that the rejection of claims 9, 10, 12, and 17 under 35 U.S.C. § 103(a) as being unpatentable over the Miyagawa patent in view of the Matsubara patent, be reconsidered and withdrawn.

### **CONCLUSION**

Wherefore, in view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

This Amendment increases the number of independent claims by 1 from 3 to 4, does not increase the total number of claims, and does not present any multiple dependency claims. Accordingly, a Response Transmittal and Fee Authorization form authorizing the amount of \$88.00 to be charged to Sidley Austin Brown & Wood LLP's

Application No. 09/665,915  
Amendment dated December 1, 2004  
Reply to Office Action of September 8, 2004

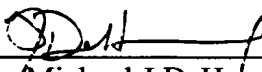
Deposit Account No. 18-1260 is enclosed herewith in duplicate. However, if the Response Transmittal and Fee Authorization form is missing, insufficient, or otherwise inadequate, or if a fee, other than the issue fee, is required during the pendency of this application, please charge such fee to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260.

Any fee required by this document other than the issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

Respectfully submitted,

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